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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/808,771	03/25/2004	John M. Cioffi	8241P005	5887

8791 7590 02/20/2009

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EXAMINER	
RIYAMI, ABDULLA A	
ART UNIT	PAPER NUMBER
2416	

MAIL DATE	DELIVERY MODE
02/20/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/808,771	CIOFFI, JOHN M.	
	Examiner	**Art Unit**	
	ABDULLAH RIYAMI	2416	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 20 November 2008.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 39-75 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 39-75 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1. This is in response to an amendment/response filed on 11/20/2008.

2. Claims 1-38 have been canceled.

3. New claims 39-75 have been added.

4. Claims 39-75 remain pending in the application.

Response to Arguments

Applicant's arguments with respect to claims 39-75 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 39 are rejected under 35 U.S.C. 103 as being unpatentable by Tsatsanis et al. (US 2006/0056522 A1) in view of Henderson et al. (US 6678375) further in view of Fishman (US 2004/0157566 A1).

As per claim 39, Tsatsanis discloses a DSL (Digital Subscriber Line) system (see paragraph 3, lines 3-4, various versions of DSL technologies) comprising: a multiple loop segment comprising a plurality of bonded loops (see figure 2, bundle 208, paragraph 43, lines 1-7, central office with series of DSL modems connected to customers), each loop comprising a twisted pair of wires (see paragraph 12, line 2, copper twisted pair), the loops being coupled at one end to a controller and at the other end (see figure 2, central office 202), opposite the controller, to a plurality of different customer premises equipments (CPEs) (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N) to provide at least one DSL communications channel to each respective CPE (see figure 2, customer premises equipment 212, DSL 210-1 through 210-N)), there being at least one loop coupled to each CPE (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N);

the controller to monitor the multiple loop segment and to generate control signals based on the monitoring (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

Tsatsanis does not expressly disclose wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs.

Henderson discloses wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.).

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as

a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

Henderson and Tsatsanis do not expressly disclose a vectoring unit also coupled to the multiple loop segment, to receive the control signals and to vector transmissions to the CPEs through the communications channels across multiple loops of the multiple loop segment that are coupled to different CPEs.

Fishman discloses a vectoring unit (see figure 4, PCV processing unit 5) also coupled to the multiple loop segment (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs), to receive the control signals and to vector transmissions to the CPEs through the communications channels across multiple loops of the multiple loop segment that are coupled to different CPEs (see figure 4, PCV

processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units).

Fishman, Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fishman's technique of using a vectoring unit (see figure 4, PCV processing unit 5) also coupled to the multiple loop segment (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs), to receive the control signals and to vector transmissions to the CPEs through the communications channels across multiple loops of the multiple loop segment that are coupled to different CPEs (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units) in Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a vast improvement of broadband transmission via telephone cables by crosstalk reduction (see paragraph 15, lines 1-5, Fishman).

As per claim 40, Tsatsanis discloses wherein the control signals are used to operate the multiple loop segment as a vectored system across all loops of the multiple loop segment that carry active communications channels (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

As per claim 41, Fishman discloses wherein the vectoring unit comprises a pedestal vectoring unit (PVU) and wherein the PVU vectors transmissions to and from the CPEs using the control signals (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 42, Fishman discloses wherein the PVU is in a pedestal (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 43, Fishman discloses wherein the PVU comprises a vector signal processing module and wherein the controller comprises a vectoring control means coupled to the vector signal processing module (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other

respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 44, Fishman discloses further comprising a customer vectoring unit (CVU) at the CPE and coupled to the controller to vector transmissions to and from the CPEs (see figure 2, receiver, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 45, Fishman discloses wherein the PVU is in a first pedestal and the CVU is in a second pedestal (see figure 2, receiver, transmitter, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 46, Fishman discloses wherein at least one of the communication channels is operated using an expanded frequency spectrum (see paragraph 7, dynamic spectral management of twisted pairs).

As per claim 47, Fishman discloses wherein the controller comprises a frequency bandwidth controlling means used in transmitting data across the multiple loop segment (see paragraph 7, dynamic spectral management of twisted pairs).

As per claim 48, Fishman discloses wherein the controller is a dynamic spectrum manager comprising vectoring control means (see paragraph 8, another dynamic spectral management of twisted pairs is known as vectoring).

As per claim 49, Fishman discloses wherein the controller comprises a computer system (see figure 4, PCV transmission system).

As per claim 50, Tsatsanis discloses a first impedance matching circuit coupled to a first end of the multiple loop segment and a second impedance matching circuit coupled to a second end of the multiple loop segment (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors).

As per claim 51, Tsatsanis discloses placing an impedance between each wire and each other wire (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors).

As per claim 52, Tsatsanis discloses wherein the DSL system is one of an ADSL system and a VDSL system (see paragraph 42, line 5, ADSL, VDSL).

As per claim 53, Tsatsanis discloses wherein the loops are bonded using one of the following bonding protocols: TDIM bonding; Ethernet bonding; ATM bonding; or the G.bond protocol (see paragraph 46, line 1-5, combining multiple copper pairs).

As per claim 54, Tsatsanis discloses wherein the plurality of twisted pairs number K twisted pairs so that there are 2K wires in the segment (see figure 2, (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N) and using vectoring across the channels (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

Tsatsanis does not expressly disclose one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels.

Henderson discloses one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.).

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

As per claim 55, Tsatsanis discloses a DSL (Digital Subscriber Line) system (see paragraph 3, lines 3-4, various versions of DSL technologies) comprising: a multiple loop segment comprising a plurality of bonded loops (see figure 2, bundle 208, paragraph 43, lines 1-7, central office with series of DSL modems connected to customers), each loop in the multiple loop segment having a pair of wires (see paragraph 12, line 2, copper twisted pair),

the segment being coupled at a first end to a plurality of different customer premises equipments (CPEs) to provide different channels to different CPEs (see paragraph 43, lines 3-5,

connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N).

Tsatsanis does not expressly disclose the wires of the multiple loop segment being connected so that at least two wires of the multiple bonded loops each carry a communication channel using a third wire of the multiple bonded loops as a common reference wire.

Henderson discloses the wires of the multiple loop segment being connected so that at least two wires of the multiple bonded loops each carry a communication channel using a third wire of the multiple bonded loops as a common reference wire (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.)

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as

central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

Henderson and Tsatsanis do not expressly disclose a first vectoring unit coupled at the first end of the multiple loop segment resident at one of the CPEs of the plurality of different CPEs, the first vectoring unit comprising a first vector signal processing module; and a second vectoring unit coupled to a second end opposite the first end of the multiple loop segment opposite the plurality of CPEs and comprising a second vector signal processing module; wherein the first and second vectoring units provide vectored transmissions across the multiple loop segment, the second vectoring unit vectoring upstream and downstream transmissions with the plurality of CPEs across all active channels of the segment across different CPEs.

Fishman discloses a first vectoring unit (see figure 4, PCV processing unit 5, to the top pair) coupled at the first end of the multiple loop segment resident at one of the CPEs of the plurality of different CPEs (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs), the first vectoring unit comprising a first vector signal processing module (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7); and a second vectoring unit (see figure 4, PCV processing unit 5, to the bottom pair) coupled to a second end opposite the first end of the

multiple loop segment opposite the plurality of CPEs (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) and comprising a second vector signal processing module (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7); wherein the first and second vectoring units provide vectored transmissions across the multiple loop segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units), the second vectoring unit vectoring upstream and downstream transmissions with the plurality of CPEs across all active channels of the segment across different CPEs (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

Fishman, Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fishman’s technique of using a first vectoring unit (see figure 4, PCV processing unit 5, to the top pair) coupled at the first end of the multiple loop segment resident at one of the CPEs of the plurality of different CPEs (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs), the first vectoring unit comprising a first vector signal processing module (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7); and a second vectoring unit (see figure 4, PCV processing unit 5, to the bottom pair) coupled to a second end opposite the first end of the

multiple loop segment opposite the plurality of CPEs (see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) and comprising a second vector signal processing module (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7); wherein the first and second vectoring units provide vectored transmissions across the multiple loop segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units), the second vectoring unit vectoring upstream and downstream transmissions with the plurality of CPEs across all active channels of the segment across different CPEs (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) in Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a vast improvement of broadband transmission via telephone cables by crosstalk reduction (see paragraph 15, lines 1-5, Fishman).

As per claim 56, Fishman discloses a controller coupled to the second end of the multiple loop segment and to the first and second vectoring units, the controller comprising vectoring control means to assist in regulating transmissions across the multiple loop segment (see figure 2, receiver, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 57, Fishman discloses wherein the controller is a dynamic spectrum manager (see paragraph 7, dynamic spectral management of twisted pairs).

As per claim 58, Fishman discloses wherein the controller further comprises frequency bandwidth control means for regulating the frequency bandwidth used in transmissions across the multiple loop segment (see paragraph 8, another dynamic spectral management of twisted pairs is known as vectoring).

As per claim 59, Fishman discloses wherein the first vectoring unit is in a first pedestal and further wherein the second vectoring unit is in a second pedestal (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the

PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 60, Fishman discloses wherein the first vectoring unit is in a customer premises and further wherein the second vectoring unit is in a pedestal (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 61, Tsatsanis discloses a first impedance matching circuit coupled to the first end of the multiple loop segment (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors) and a second impedance matching circuit coupled to the second end of the multiple loop segment (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors).

As per claim 62, Tsatsanis discloses a DSL (Digital Subscriber Line) system (see paragraph 3, lines 3-4, various versions of DSL technologies) comprising: a multiple loop segment (see figure 2, bundle 208, paragraph 43, lines 1-7, central office with series of DSL modems connected to customers), each loop in the multiple loop segment having a pair of wires (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N), the wires being connected as communication

channels to a plurality of different customer premises equipments (CPEs) coupled to one end of the multiple loop segment (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N) to provide different channels to different CPEs (see paragraph 12, line 2, copper twisted pair),

a controller coupled opposite the plurality of different CPEs (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system), the controller comprising: means for collecting data regarding transmissions across the communications channels of the multiple loop segment (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

Tsatsanis does not expressly disclose the wires in each loop being connected so that at least two wires of the multiple bonded loops each carry a communication channel using a third wire of the multiple bonded loops as a common reference wire.

Henderson discloses the wires of the multiple loop segment being connected so that at least two wires of the multiple bonded loops each carry a communication channel using a third wire of the multiple bonded loops as a common reference wire (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.)

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

Henderson and Tsatsanis do not expressly disclose means for controlling vectoring of transmissions across the communications channels of the multiple loop segment to vector upstream and downstream transmissions with the plurality of CPEs across all active channels of the communications channels of the segment.

Fishman discloses means for controlling vectoring of transmissions across the communications channels (see figure 4, PCV processing unit 5, to the top pair, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) of the multiple loop segment to vector upstream and downstream transmissions with the plurality of CPEs across all active channels of the communications channels of the segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

Fishman, Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fishman's technique of using a means for controlling vectoring of transmissions across the communications channels (see figure 4, PCV processing unit 5, to the top pair, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) of the multiple loop segment to vector upstream and downstream transmissions with the plurality of CPEs across all active channels of the communications channels of the segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) in Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such

that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a vast improvement of broadband transmission via telephone cables by crosstalk reduction (see paragraph 15, lines 1-5, Fishman).

As per claim 63, Tsatsanis discloses a vector signal processing module coupled to the controller and opposite the plurality of different CPEs to perform vectoring of the transmissions in response to the controller (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

As per claim 64, Tsatsanis discloses a first impedance matching circuit coupled between a first end of the multiple loop segment and the CPEs (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors) and a second impedance matching circuit coupled between a second end of the multiple loop segment and the vector signal processing module (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors).

As per claim 65, Tsatsanis discloses a second vector signal processing module coupled to the first impedance matching circuit resident at one of the plurality of different CPEs (see figure 12, a second impedance matching circuit coupled to a second end of the segment, see paragraph 101, matching using resistors).

As per claim 66, Fishman discloses wherein the multiple loop segment couples customer premises equipment to a pedestal (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 67, Fishman discloses wherein the multiple loop segment couples a first pedestal to a second pedestal (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic). Tsatsanis also discloses a DSL system wherein the PVU is in a pedestal or first pedestal (see figure 2, blocks 204-1 to 204-N) and further wherein the CVU is in a customer premises or second pedestal (see figure 2, blocks 210-1 to 210-N).

As per claim 68, Tsatsanis discloses a method of sending DSL signals through multiple communication channels (see paragraph 3, lines 3-4, various versions of DSL technologies) comprising:

sending a first signal through a first communications channel to a first customer premises equipment (CPE) using at least two wires of a multiple loop segment (see figure 2, bundle 208, paragraph 43, lines 1-7, central office with series of DSL modems connected to customers),

sending a second signal through a second communications channel to a second CPE using a second at least two wires of the same multiple loop segment (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N).

Tsatsanis does not expressly disclose wherein the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment.

Henderson discloses wherein the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.).

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

Henderson and Tsatsanis do not expressly disclose vectoring upstream and downstream transmissions through the first and second communications channels across the first and second communications channels and the first and second CPEs from an upstream location coupled to the first and second communications channels opposite the CPEs,

Fishman discloses vectoring (see figure 4, PCV processing unit 5, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) upstream and downstream transmissions through the first and second communications channels across the first and second communications channels (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for

distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) and the first and second CPEs from an upstream location coupled to the first and second communications channels opposite the CPEs (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

Fishman, Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fishman's technique of vectoring (see figure 4, PCV processing unit 5, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) upstream and downstream transmissions through the first and second communications channels across the first and second communications channels (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) and the first and second CPEs from an upstream location coupled to the first and second communications channels opposite the CPEs (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8,

compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) in Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a vast improvement of broadband transmission via telephone cables by crosstalk reduction (see paragraph 15, lines 1-5, Fishman).

As per claim 69, Tsatsanis discloses wherein vectoring comprises one-sided vectoring from the location opposite the CPEs (see figure 5, x (k) vector of signals).

As per claim 70, Tsatsanis et al. discloses wherein vectoring transmissions across the multiple loop segment comprises two-sided vectoring (see figure 5, x (k) vector of signals).

As per claim 71, Fishman discloses comprising collecting data regarding transmissions across the multiple loop segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) and

providing vectoring control signals to a vectoring unit of the multiple loop segment based on the monitoring (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 72, Tsatsanis discloses wherein the plurality of twisted pairs number K twisted pairs so that there are 2K wires in the segment (see figure 2, (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N) and using vectoring across the channels (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system).

Tsatsanis does not expressly disclose one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels.

Henderson discloses one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.).

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein one of the 2K wires being selected as a reference wire, the remaining (2K-1) wires being referenced to the reference wire to provide up to (2K-l) communications channels, the (2K-l) channels (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

As per claim 73, Tsatsanis discloses computer-readable medium having instructions stored thereon, that when executed by a computer causes the computer to perform operations (see paragraph 3, lines 3-4, various versions of DSL technologies) comprising:

collecting data regarding DSL (Digital Subscriber Line) transmissions (see paragraph 62, lines 1-9, MIMO preprocessor within a transmitter converts symbol vectors into an associated signal vector, the signal vector is transmitted over multiple lines in a communication system) on

a plurality of loops of a multiple loop segment (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N), each loop having a pair of wires to carry transmissions to customer premises equipment (CPE) (see paragraph 43, lines 3-5, connected twisted pairs 206-1 through 206-N as a bundle 208 connected to customers DSL210-1 through 210-N).

Tsatsanis does not expressly disclose wherein the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment.

Henderson discloses wherein the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.).

Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Henderson's technique wherein the first communication channel comprises at least two wires of the multiple loop segment referenced to a third common reference wire of the multiple loop segment (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common

wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a significant increase in speed for data transmission and the total data rate for transmission over twisted pairs can approach three times the data rate of previous data rate, substantially reducing the time for data transmission. By designating a common wire to support a plurality of lines, then more lines transmit data to provide much desired higher data rates (see column 6, lines 60-62, Henderson).

Henderson and Tsatsanis do not expressly disclose generating control signals to control vectoring of the transmissions across the plurality of loops with the plurality of different CPEs across different communications channels of the segment.

Fishman discloses generating control signals to control vectoring of the transmissions across the plurality of loops (see figure 4, PCV processing unit 5, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) with the plurality of different CPEs across different communications channels of the segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

Fishman, Henderson and Tsatsanis are analogous art because they are from the same field of endeavor of DSL transmission.

At the time of the invention it would have been obvious to one of ordinary skill in the art to use Fishman's technique of generating control signals to control vectoring of the transmissions

across the plurality of loops (see figure 4, PCV processing unit 5, see paragraph 16, lines 1-7, phase conjugated vectoring of transmission signals propagating via a plurality of twisted pairs) with the plurality of different CPEs across different communications channels of the segment (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic) in Henderson's technique wherein for at least one CPE, a plurality of twisted pairs of wires are coupled to the CPE such that one wire of the plurality of twisted pairs of wires is selected as a reference wire and the other wires of the plurality of twisted pairs of wires are referenced to the reference wire to provide more communications channels than there are twisted pairs (see figures 4, common wire 413, and figure 5, common wire 533, and column 3, lines 55-67, any number N of individual wires can support N-1 distinct lines, channels, and or circuits, and column 4, lines 1-51, first wire 407, second wire 409, third wire 411, a common wire 413, may be configured as central office termination, customer premises termination etc.) in Tsatsanis's DSL system (fig 2, multi-line transmission technique).

The motivation to combine would have been to have a vast improvement of broadband transmission via telephone cables by crosstalk reduction (see paragraph 15, lines 1-5, Fishman).

As per claim 74, Fishman discloses wherein the operations further comprise providing the control signals to a vectoring unit to vector upstream and downstream transmissions across the different communication channels (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other

respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

As per claim 75, Fishman discloses, wherein the operations further comprise generating control signals to control the frequency bandwidth used in transmitting data across the different communication channels (see figure 4, PCV processing unit 5 and PCV bank 6 and PCV transmission system 7, see paragraph 56, lines 1-15, PCV units for distribution among other respective units, see paragraph 53, lines 1—8, compensation of crosstalk of signals propagating in the downstream direction, appropriate correction signals applied to upstream traffic).

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See form 892.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ABDULLAH RIYAMI whose telephone number is (571)270-3119. The examiner can normally be reached on Monday through Thursday 8am-5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Aung Moe can be reached on (571) 272-7314. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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